

PH FR 010054EP PCT	M DOSSIER
--------------------------	--------------

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

FR010054EP



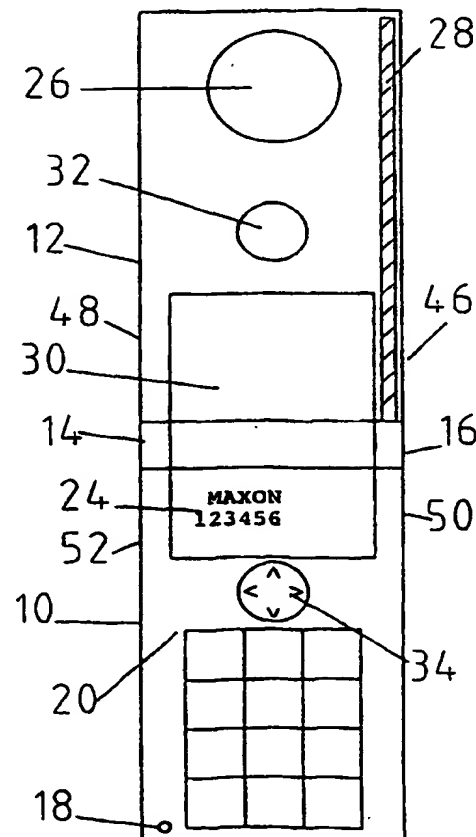
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : H04M 1/02	A1	(11) International Publication Number: WO 99/23800
		(43) International Publication Date: 14 May 1999 (14.05.99)
(21) International Application Number: PCT/GB97/03010 (22) International Filing Date: 31 October 1997 (31.10.97) (71) Applicant (for all designated States except US): MAXON SYSTEMS INC. (LONDON) LTD. [GB/GB]; Maxon House, Honeycrock Lane, Salfords, Surrey RH1 5JP (GB). (72) Inventors; and (75) Inventors/Applicants (for US only): CUSHION, Clive [GB/GB]; 2 Victory Road, Wanstead, London E11 1UL (GB). BALDRY, Frank [GB/GB]; Hazelbank House, 109 Haslemere Road, Liphook, Hants. DU30 7BU (GB). (74) Agent: SCHMIDT, Steffen, J.; Wuesthoff & Wuesthoff, Patent- und Rechtsanwälte, Schweigerstrasse 2, D-81541 München (DE).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published With international search report.

(54) Title: CELLULAR HANDHELD TELECOMMUNICATIONS DEVICE

(57) Abstract

A cellular handheld telecommunications device which is contained in a first and a second part of a housing, with the second part of the housing being connected to the first part of the housing by a hinge means such that the first and second parts of the housing can be folded together or unfolded, where the first part of the housing contains a microphone to receive voice energy, a transceiver to transmit/receive voice and/or data signals to/from a cellular base station, a keypad to enter control commands to control the operation of the device and/or to enter alphanumerical data to determine a party to be called and/or to generate a message to be sent to a party to be called, an alphanumerical display to display alphanumerical data related to a control command entered via said keypad or to a message to be sent or received, a battery to provide electrical power to the components of said device, and where the second part of the housing contains a speaker to emit received voice signals, and an rf antenna to transceive rf energy, and the second part of the housing is shaped and dimensioned such that when the first and second parts of the housing are folded together, the alphanumerical display in the first part of the housing is at least partly visible.



THIS PAGE BLANK (USPTO)

5

Cellular handheld telecommunications device

10

Description

15

The present invention is related to a cellular handheld telecommunications device, and more specifically to the type of cellular handheld telecommunications device where the device is contained in a first and a second part of a housing with the second part of the housing being connected to the first part of the housing by a hinge means such that the first and second parts of the housing can be folded together or unfolded.

20

25

Various models of such cellular handheld telecommunications devices are available in the prior art. In some embodiments (e.g. Motorola's MicroTAC series), one part of the housing contains all the essential components (transceiver, battery, keypad, display, microphone, speaker, battery, antenna etc.), while the second part of the housing only serves as a lid or cover of the keypad. In this embodiment, the second part of the housing is basically provided for cosmetic reasons and does not serve as a containment for components.

30

35

In other embodiments (e.g. Nokia's Communicator series) in their closed position, the two halves of the housing entirely conceal the keypad and the display. Moreover, the device is relatively bulky and its shape is not very ergonomic.

40

Yet another type of models (e.g. Motorola's STARTAC series) also has two halves that form the housing. However, in the closed position of the two halves, the display (and the keypad) is not visible. Moreover, the battery is integrated into the upper half of the housing which - in the opened use

-2-

5 position - is held against the ear of the user. Thus, this device is relatively unbalanced due to a high centre of gravity. Moreover, in this device, the (extractable) antenna is provided in the lower (other) half of the housing, also resulting in cumbersome handling.

10

In view of the drawbacks of the known devices, the problem underlying the present invention is to provide a cellular handheld telecommunications device which is more user friendly and more ergonomic than the prior art devices.

15

To solve this problem, a cellular handheld telecommunications device having a first and a second part of a housing is provided, wherein the second part of the housing is connected to the first part of the housing by a hinge means such that
20 the first and second parts of the housing can be folded together or unfolded, the first part of the housing contains a microphone to receive voice energy, a transceiver to transmit/receive voice and/or data signals to/from a cellular base station, a keypad to enter control commands to control
25 the operation of the device and/or to enter alphanumerical data to determine a party to be called and/or to generate a message to be sent to a party to be called, an alphanumerical display to display alphanumerical data related to a control command entered via said keypad or to a message to be sent or received, a battery to provide electrical power to the
30 components of said device, and the second part of the housing contains a speaker to emit received voice signals, and an rf antenna to transceive rf energy, and the second part of the housing is dimensioned such that when the first and second
35 parts of the housing are folded together, the alphanumerical display in the first part of the housing is at least partly visible.

This unique concept provides a number of advantages over the
40 prior art. First of all, when the two parts of the housing are in their unfolded (use) position, the microphone and the

-3-

5 speaker are in their optimum distance. Moreover, the user can select the angle between the two halves so that the user's individual desires for the distance between the microphone and the speaker can be adjusted.

10 Secondly, even in the closed (standby) position of the device, the display is (at least) partly visible, so that incoming messages or the like are readily visible.

15 Furthermore, since the battery is provided in the same part of the housing as the transceiver, there is no requirement for a flexible (rotatable) power line connecting the two parts of the housing.

20 Also, the weight distribution between the two halves of the device is more convenient for the user since in use, the "heavier" half (containing the battery, the keypad, the display and the microphone) lies in the palm of the user's hand.

25 With the antenna being provided in the upper ("lighter") half of the device, the rf energy transmission and reception is improved over a design, where the antenna is virtually surrounded by the user's hand and head.

30 All these advantages result directly from the unique concept according to the invention described above.

35 In a preferred embodiment of the present invention, the second part of the housing is dimensioned such that when the first and second parts of the housing are folded together, the keypad is at least partly accessible. This feature allows for an easy access to the functionality of the device. While in prior art devices having two halves, the user must open the device in order to operate the keypad, the invention
40 allows to operate the keypad (enter messages, edit the telephone directory in the device, select menu items provided

-4-

5 in the device etc.) without having to open it. Hence, the device can be put on a table in its closed (less prominent) position while still allowing to access (at least a part of) its features.

10 In a presently preferred embodiment of the invention, a special key (e.g. a cross switch) is the only key accessible in the closed position of the device. Nevertheless, the software in the device controlling the menu and its functions is so designed that the user has all options available by
15 selectively operating this special key.

In another embodiment, the keypad is (at least partly) designed as a part of a touch screen. Hence, relevant functions of the device are accessible while the device is in
20 its closed (Standby) mode of operation.

In another embodiment of the present invention, the second part of the housing contains an rf shielding to protect a user's head against rf radiation when the device is held at
25 user's head with the first and second parts of the housing unfolded. While this feature is relatively difficult to achieve in a device where the antenna is in the part of the housing containing all relevant parts of the telephone, the device according to the invention allows for this option very
30 easily.

Alternatively, a conventional rod type antenna could be provided the first part of the housing and rf shielding in the second part of the housing provides some protection
35 against radiation into the user's head.

While prior art designs require relatively complicated connections (Motorola StarTac: flexible power line, Nokia Communicator: flexible multiwire) to connect the components
40 in the two halves of the housing, in one embodiment, the present invention teaches that the hinge means connecting the

-5-

5 first and second parts of the housing is formed by two joints, and that the joints are provided at two opposite walls of the first and second parts of the housing, respectively.

10 More specifically, one of said joints comprises a rotatable rf connection to connect said rf antenna and said transceiver, and another of said joints comprises a rotatable electrical connection to connect said speaker and said transceiver. The rotatable rf connection can be formed by a
15 coaxial male/female rf coupling. The connection for the speaker can be formed in a similar manner.

Other features, characteristics, advantages and modifications of the present invention are explained in detail in the
20 following description of an embodiment of the invention with reference to the enclosed drawings.

Fig. 1 is a schematic top view of the cellular handheld telecommunications device according to the present invention
25 in its opened state.

Fig. 2 is a schematic side view of the cellular handheld telecommunications device of Fig. 1.

30 Fig. 3 is a schematic top view of the cellular handheld telecommunications device of Fig. 1 in its closed state.

Fig. 4 is a schematic side view of the cellular handheld telecommunications device of Fig. 3.

35

The drawings show a cellular handheld telecommunications device which is mounted in a a first part (10) and a second part (12) of a housing. The second part (12) of the housing is connected to the first part (10) of the housing by a hinge
40 (14, 16). Thus, the first and second parts (10, 12) of the housing can be folded together (as shown in Fig. 3 and 4) or

-6-

5 unfolded (as shown in Fig. 1 and 3). The first and second parts (10, 12) of the housing have a generally rectangular shape and the hinge 14, 16 connects the first and second parts (10, 12) of the housing at a short edge of the two halves (10, 12), respectively. In other embodiments of the
10 device according to the invention, the shapes of the first and second parts (10, 12), respectively are more rounded or oval.

The first part (10) of the housing contains a microphone (18)
15 to receive voice energy from a user, a transceiver (not shown in the Figs.) to transmit/receive voice and/or data signals to/from a cellular base station, a keypad (20) to enter control commands to control the operation of the device and/or to enter alphanumerical data to determine a party to
20 be called and/or to generate a message to be sent to a party to be called, and an alphanumerical display (24) to display alphanumerical data related to a control command entered via said keypad or to a message to be sent or received. Moreover, a battery (22) is removably attached to the first part (10)
25 of the device to provide electrical power to the components of the device.

The second part (12) of the housing contains a speaker (26) to emit voice signals received by the transceiver, and an rf
30 antenna (28) to transceive rf energy.

The second part (12) of the housing is provided with a cutout (30) having essentially the size and the shape of the display (24). Thus, when the first and second parts (10, 12) of the
35 housing are folded together (Fig. 3), the alphanumerical display (24) is visible through the cutout (30).

Moreover, the second part (12) of the housing is dimensioned and shaped such that when the first and second parts (10, 12)
40 of the housing are folded together, a cross-switch (34) of the keypad (20) is accessible. This is achieved by an opening

-7-

5 (32) in the second part (12) of the housing allowing the cross-switch (34) of the keypad (20) to project through through the second part (12) of the housing.

10 Furthermore, the second part (12) of the housing contains an rf shielding (40) provided adjacent to the wall (42) of the second part (12) of the housing which in use is oriented towards the user's head. Thus, the user's head is at least partially protected against rf radiation when the device is held at user's head with the first and second parts (10, 12)
15 of the housing unfolded.

The hinge (14, 16) which connects the first and second parts (10, 12) of the housing is formed by two joints which are provided at two opposite walls (46, 48; 50, 52) of the second
20 part and of the first part of the housing, respectively.

One of said joints (16) (the right joint in Fig. 1) comprises a rotatable rf connection to connect the rf antenna 28 and the transceiver. The other of the joints (14) the left joint
25 in Fig. 1) comprises a rotatable electrical connection to connect the speaker 26 and said transceiver.

30

- 35

40

5 Claims

1. A cellular handheld telecommunications device which is contained in

- 10 - a first and a second part of a housing,
- with the second part of the housing being connected to the first part of the housing by a hinge means such that the first and second parts of the housing can be folded together or unfolded,
- 15 - the first part of the housing contains
- a microphone to receive voice energy,
- a transceiver to transmit/receive voice and/or data signals to/from a cellular base station,
- a keypad to enter control commands to control the operation
20 of the device and/or to enter alphanumerical data to determine a party to be called and/or to generate a message to be sent to a party to be called,
- an alphanumerical display to display alphanumerical data related to a control command entered via said keypad or to a
25 message to be sent or received,
- a battery to provide electrical power to the components of said device, and
- the second part of the housing contains
- a speaker to emit received voice signals, and
30 - an rf antenna to transceive rf energy, and
- the second part of the housing is shaped and dimensioned such that when the first and second parts of the housing are folded together, the alphanumerical display in the first part of the housing is at least partly visible.

35 2. The cellular handheld telecommunications device according to claim 1, characterized in that

- 40 - the second part of the housing is dimensioned such that when the first and second parts of the housing are folded together, the keypad is at least partly accessible.

5 3. The cellular handheld telecommunications device according to claim 1 or 2, characterized in that,
- a special key of the keypad is the only key accessible in the closed position of the device.

10 4. The cellular handheld telecommunications device according to claim 1, 2 or 3, characterized in that
- the keypad is designed as a part of a touch screen.

15 5. The cellular handheld telecommunications device according to claim 1, 2, 3, or 4, characterized in that
- the second part of the housing contains an rf shielding to protect a user's head against rf radiation when the device is held at user's head with the first and second parts of the housing unfolded.

20 6. The cellular handheld telecommunications device according to claim 1, 2, 3, 4, 5, or 6, characterized in that
- the hinge means connecting the first and second parts of the housing is formed by two joints, and that
25 - the joints are provided at two opposite walls of the first and second parts of the housing, respectively.

30 7. The cellular handheld telecommunications device according to claim 6, characterized in that
- one of said joints comprises a rotatable rf connection to connect said rf antenna and said transceiver, and
- another of said joints comprises a rotatable electrical connection to connect said speaker and said transceiver.

1 / 2

Fig.1

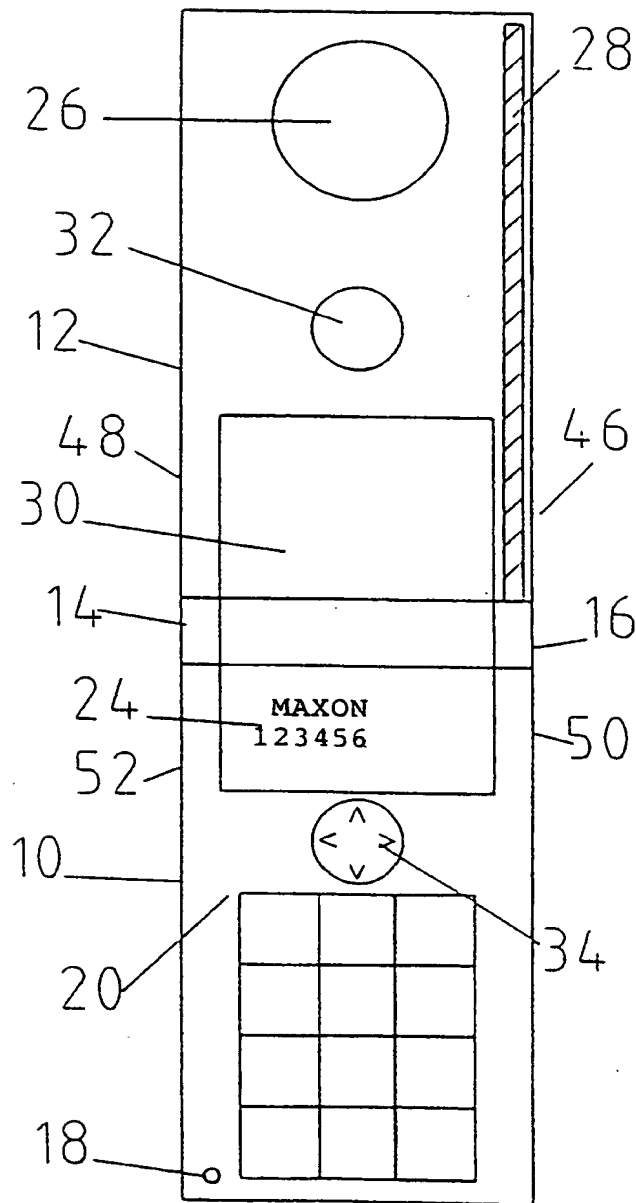
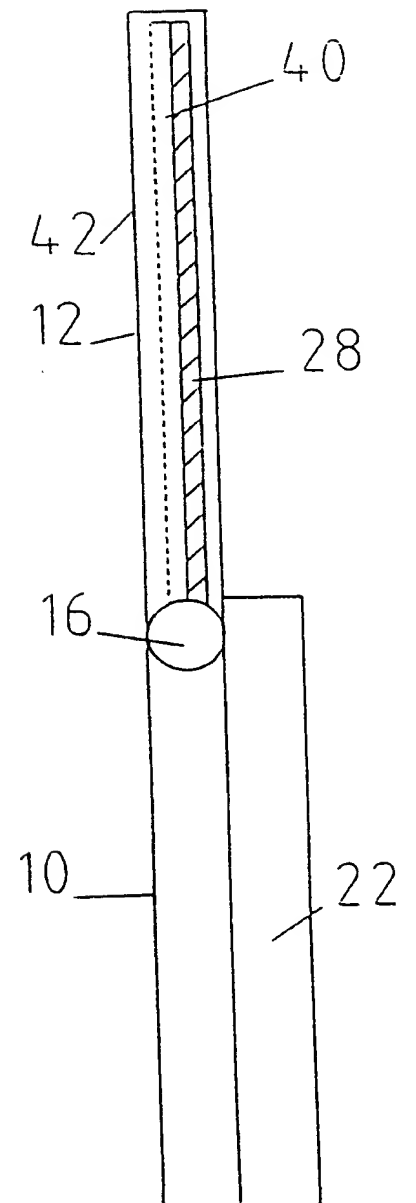
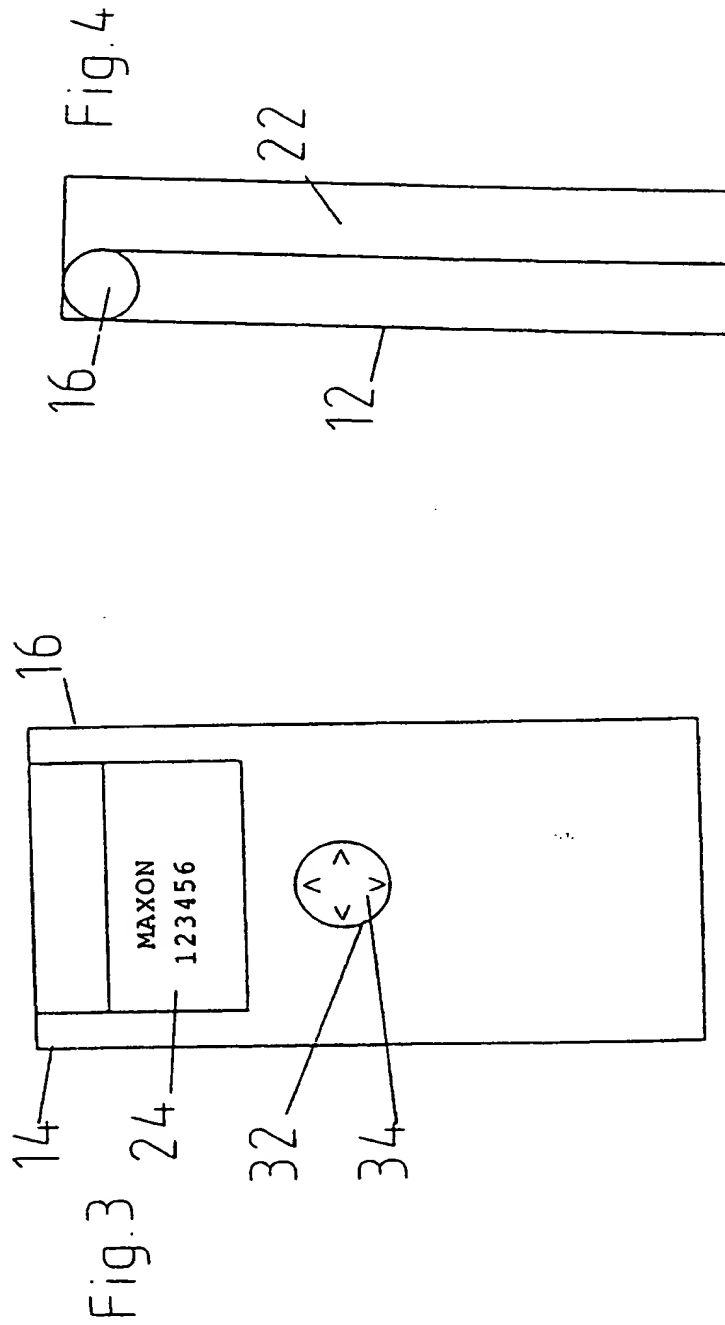


Fig.2





INTERNATIONAL SEARCH REPORT

national Application No
PCT/GB 97/03010

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04M1/02

According to International Patent Classification(IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 H04M H04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 94 13088 A (MOTOROLA INC) 9 June 1994 see abstract see page 4, line 3 - page 6, line 35; figures 1,2	1-3,6,7
A	EP 0 647 037 A (NIPPON ELECTRIC CO) 5 April 1995 see abstract see column 6, line 7 - column 7, line 3; figures 9-11	1-3,6
A	GB 2 280 322 A (NIPPON ELECTRIC CO) 25 January 1995 see page 4, line 14 - page 5, line 4; figures 1A,1B	1,2

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

14 July 1998

Date of mailing of the international search report

21/07/1998

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Golzio, D

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 97/03010

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	PATENT ABSTRACTS OF JAPAN vol. 017, no. 069 (E-1318), 10 February 1993 & JP 04 273639 A (TOSHIBA CORP), 29 September 1992, see abstract	1
A	EP 0 661 823 A (NIPPON ELECTRIC CO) 5 July 1995 see abstract see column 2, line 53 - column 3, line 54; figures 1-3	1
A	GB 2 308 938 A (MOTOROLA INC) 9 July 1997 see page 3, line 3 - page 4, line 26; figures 1,2	1
A	GB 2 289 595 A (NIPPON ELECTRIC CO) 22 November 1995 see abstract; figures 4A-4C, 6A-6C	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/GB 97/03010

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9413088	A	09-06-1994	BR 9305827 A	18-02-1997
			CA 2127268 A	09-06-1994
			CN 1091873 A	07-09-1994
			EP 0629326 A	21-12-1994
			FR 2698747 A	03-06-1994
			HU 68096 A	29-05-1995
			IT 1262465 B	19-06-1996
			JP 2676428 B	17-11-1997
			JP 7503119 T	30-03-1995
			MX 9307579 A	30-06-1994
EP 0647037	A	05-04-1995	JP 2630224 B	16-07-1997
			JP 7107001 A	21-04-1995
			AU 692168 B	04-06-1998
			AU 7413894 A	13-04-1995
			FI 944491 A	31-03-1995
			US 5564078 A	08-10-1996
GB 2280322	A	25-01-1995	JP 2576367 B	29-01-1997
			JP 7038461 A	07-02-1995
			JP 7074807 A	17-03-1995
			AU 682871 B	23-10-1997
			AU 6861694 A	02-02-1995
			FI 943471 A	24-01-1995
			GB 2319416 A	20-05-1998
			GB 2319417 A	20-05-1998
EP 0661823	A	05-07-1995	JP 7202748 A	04-08-1995
			FI 946099 A	29-06-1995
GB 2308938	A	09-07-1997	CA 2192414 A	04-07-1997
			FR 2743250 A	04-07-1997
GB 2289595	A	22-11-1995	JP 2595932 B	02-04-1997
			JP 7312631 A	28-11-1995
			US 5657370 A	12-08-1997